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多属性隐式变权决策分析方法

李春好[1], 杜元伟[2], 孙永河[2], 田硕 [1]

1. 吉林大学管理学院, 吉林 长春 130022;
2. 昆明理工大学管理与经济学院, 云南 昆明 650093

Approach to Multiple Attribute Decision Making with Weights Implicitly Changing

LI Chun-hao[1], DU Yuan-wei[2], SUN Yong-he[2], TIAN Shuo[1]

1. School of Management, Jilin University, Changchun 130022, China;
2. Faculty of Management and Economics, Kunming University of Science and Technology, Kunming, 690093, China

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摘要 为克服多因素变权决策方法的内在缺陷,基于Belton 和Gear提出的B/G-AHP层次分析原理给出了一种隐含式的多属性变权决策建模思想,并运用该思想给出了一种多属性变权决策新方法。它相对于多因素变权决策方法具有三方面的比较优势。其一,依赖的变权偏好信息直接由决策者给出,因而能够克服决策分析者对决策结果的主观武断性影响,更好地反映决策者的真实偏好。其二,不会受到由因素的属性值转化为偏好值所额外引入的主观测度偏差的干扰。其三,对决策者主观判断可能存在的误差予以了旨在弱化其影响的优化控制。数值分析表明新方法拥有较好的变权能力,并且相对于已有方法能够给出更易为决策者所接受的评价结论,因而具有较好的应用有效性。

关键词: 多属性决策　隐式变权　决策分析　层次分析法

Abstract： To overcome shortages of the method of multiple factor decision making with variable weights (MFDMVM), a new weights implicitly changing method for multiple attribute decision making (MADM) is presented based on the principle of analytic hierarchy process(AHP) modified by Belton and Gear (shorted as B/G-AHP). With the modeling method, one new approach to MADM with weights implicitly changing is presented. It has three advantages over the MFDMVM. First, the needed preference information to weights changing is directly provided by the decision maker (DM), and thus the approach can well overcome the decision analyst's subjective arbitrary influence and better reflect the DM's real preference. Second, it need not subjectively transform attribute states into preference on attribute states, thus it avoids error interrupts resulted from the state-to-preference transforming. Third,unlike the MFDMVM, it has adopted the optimization technique to reduce the influence of errors within the DM's subjective judgments. Numerical analysis shows that the new approach does have the efficient capability of giving variable weights to different decision alternatives, can give more acceptable evaluation results than the MFDMVM, and is more applicable to real-world decisions.

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